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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,605	03/24/2004	Ayman Fawzy Naguib	030227	7250

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EXAMINER	
HAN, CLEMENCE S	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/809,605	NAGUIB ET AL.	
	Examiner	Art Unit	
	Clemence Han	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-10,12-14,16-20 and 24-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9,10,19,20 and 24-43* is/are allowed.

6)☒ Claim(s) *2-8,12 and 16-18* is/are rejected.

7)☒ Claim(s) *13 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/31/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 12 and 16 are objected to because of the following informalities:

Regarding to claim 12, there are two typographical errors. "a signal to noise level" in line 4 should be "a signal to noise ratio". "the signal to noise" in line 9 should be "the signal to noise ratio".

Regarding to claim 16, there is a typographical error in line 10. "the signal to noise" in line 10 should be "the signal to noise ratio".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 2-4, 7, 8, 12 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Larsson et al. (US Patent 5,956,642).

Regarding claim 8, Larsson teaches a method of scheduling sub-carriers in an Orthogonal Frequency Division Multiplexing (OFDM) system, the method comprising: determining a signal to noise ratio for allocated sub-carriers (Column 4 Line 50-55); and determining a total received power at a receiver (Column 12 Line 21-22); determining a number of currently allocated sub-carriers (Column 11

Line 56-57); and adjusting a number of allocated sub-carriers based, at least in part, on the signal to noise ratio, the total received power and the number of currently allocated sub-carriers (Column 4 Line 56-63).

Regarding claim 2, Larsson teaches determining the signal to noise ratio comprising: determining a received power in a sub-carrier frequency band (Column 12 Line 20-22); determining a noise estimate in the sub-carrier frequency band during at least one time period in which a sub-carrier corresponding to the sub-carrier frequency band is unassigned (Column 10 Line 35-39); and determining a ratio of the received power in the sub-carrier frequency band to the noise estimate (Column 10 Line 48-51).

Regarding claim 3, Larsson teaches the noise estimate determined during at least one time period in which the sub-carrier is locally unassigned (Column 10 Line 35-39).

Regarding claim 4, Larsson teaches the noise estimate determined during at least one time period in which the sub-carrier is system-wide unassigned (Column 11 Line 17-18).

Regarding claim 7, Larsson teaches the signal to noise ratio comprising an average signal to noise ratio over all currently allocated sub-carrier frequency bands (Column 15 Line 28-30).

Regarding claim 12, Larsson teaches a method of scheduling sub-carriers in an Orthogonal Frequency Division Multiplexing (OFDM) system, the method comprising: determining a signal to noise ratio for allocated sub-carriers in the OFDM signal (Column 4 Line 50-55); determining if the signal to noise ratio is within a predetermined range (Column 13 Line 14-17); determining a total received power at a receiver (Column 12 Line 21-22); determining a number of currently allocated sub-carriers (Column 11 Line 56-57); and scheduling a number of sub-carriers for a communication link from the terminal to the base station based, at least in part, on whether the signal to noise ratio is within the predetermined range, the total received power and the number of currently allocated sub-carriers (Column 4 Line 56-63).

Regarding claim 16, Larsson teaches an apparatus for scheduling sub-carriers in an Orthogonal Frequency Division Multiplexing (OFDM) system, the apparatus comprising: a noise estimator 354 configured to estimate a noise level in a sub-carrier frequency band; a signal to noise ratio determination module 378 coupled to the noise estimator and configured to determine a signal to noise ratio in the sub-carrier frequency band and a total received power at a receiver (Column 12 Line 21-22); and a sub-carrier scheduler 342 coupled to the signal to noise ratio determination module and configured to schedule a number of sub-carriers based,

at least in part, on whether the signal to noise is within a predetermined range and the total received power (Column 13 Line 14-17 and Column 4 Line 56-63).

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson et al. in view of Wright (US Patent 6,570,444).

Regarding claim 5, Larsson teaches a method of scheduling sub-carriers in an Orthogonal Frequency Division Multiplexing (OFDM) system, the method comprising: determining a signal to noise ratio for allocated sub-carriers in an OFDM communication link (Column 4 Line 50-55); and adjusting a number of allocated sub-carriers based, at least in part, on the signal to noise ratio (Column 4 Line 56-63). Larsson, however, does not teach the signal to noise ratio comprising a signal to noise floor ratio. Wright teaches the signal to noise ratio comprising a signal to noise floor ratio (Column 1 Line 15). It would have been obvious to one skilled in the art to modify Larsson to use signal to noise floor ratio as taught by Wright in order to determine the minimum signal to noise ratio (Column 6 Line 13-16).

Regarding claim 17, Larsson teaches an apparatus for scheduling sub-carriers in an Orthogonal Frequency Division Multiplexing (OFDM) system, the apparatus comprising: a noise estimator 354 configured to estimate a noise level in a sub-carrier frequency band; a signal to noise ratio determination module 378 coupled to the noise estimator and configured to determine a signal to noise ratio in the sub-carrier frequency band; and a sub-carrier scheduler 342 coupled to the signal to noise ratio determination module and configured to schedule a number of sub-carriers based, at least in part, on whether the signal to noise is within a predetermined range (Column 13 Line 14-17 and Column 4 Line 56-63). Larsson, however, does not teach the signal to noise ratio comprising a signal to noise floor ratio. Wright teaches the signal to noise ratio comprising a signal to noise floor ratio (Column 1 Line 15). It would have been obvious to one skilled in the art to modify Larsson to use signal to noise floor ratio as taught by Wright in order to determine the minimum signal to noise ratio (Column 6 Line 13-16).

6. Claim 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson et al. in view of Magee et al. (US Patent 6,563,885).

Regarding claim 6, Larsson teaches a method of scheduling sub-carriers in an Orthogonal Frequency Division Multiplexing (OFDM) system, the method comprising: determining a signal to noise ratio for allocated sub-carriers in an

OFDM communication link (Column 4 Line 50-55); and adjusting a number of allocated sub-carriers based, at least in part, on the signal to noise ratio (Column 4 Line 56-63). Larsson, however, does not teach the signal to noise ratio comprising a signal to interference plus noise ratio. Magee teaches the signal to noise ratio comprising a signal to interference plus noise ratio (Column 1 Line 66-67). It would have been obvious to one skilled in the art to modify Larsson to use signal to interference plus noise ration as taught by Magee in order to compensate the noise (Column 1 Line 59-63).

Regarding claim 18, Larsson teaches an apparatus for scheduling sub-carriers in an Orthogonal Frequency Division Multiplexing (OFDM) system, the apparatus comprising: a noise estimator 354 configured to estimate a noise level in a sub-carrier frequency band; a signal to noise ratio determination module 378 coupled to the noise estimator and configured to determine a signal to noise ratio in the sub-carrier frequency band; and a sub-carrier scheduler 342 coupled to the signal to noise ratio determination module and configured to schedule a number of sub-carriers based, at least in part, on whether the signal to noise is within a predetermined range (Column 13 Line 14-17 and Column 4 Line 56-63). Larsson, however, does not teach the signal to noise ratio comprising a signal to interference plus noise ratio. Magee teaches the signal to noise ratio comprising a signal to

interference plus noise ratio (Column 1 Line 66-67). It would have been obvious to one skilled in the art to modify Larsson to use signal to interference plus noise ration as taught by Magee in order to compensate the noise (Column 1 Line 59-63).

Allowable Subject Matter

7. Claim 9, 10, 19, 20 and 24-43 are allowed.

8. Claim 13 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

9. Applicant's arguments filed February 25, 2005 have been fully considered but they are not persuasive.

In response to page 12, the applicant argues that Larson does not teach determining a total received power at a receiver. In steps 424 and 426 of Figure 4A, Larson teaches averaging power of noises of all N channels and averaging power of signals of M used channels. The determining total is an obvious step in the procedure of determining average.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clemence Han whose telephone number is (571) 272-3158. The examiner can normally be reached on Monday-Thursday 7 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.H.

Clemence Han
Examiner
Art Unit 2665

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SUPERVISORY PATENT EXAMINER
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